Investigating quality of life and depressive symptoms in the postpartum period

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Summary
Background: Mood disturbances represent the most frequent form of maternal psychiatric morbidity in the postpartum period. Nevertheless, few studies have examined the impact of postpartum depression on the mother’s quality of life.

Research question or problem: The present study aims to assess the quality of life of a sample of mothers in Southern Brazil, in order to investigate the association between postpartum depression and quality of life (QoL) standards.

Participants and methods: This study investigates a sample of 101 adult volunteers who completed the Portuguese version World Health Organization Quality of Life Assessment-Brief (WHOQOL-Brief) and Multicultural Quality of Life Index (MQLI) questionnaires. Postnatal depressive symptoms were evaluated through the Postpartum Depression Screening Scale (PDSS) and Edinburgh Postnatal Depression Scale (EPDS). Multiple regression analyses were conducted to predict the overall PDSS and EPDS scores. Pearson Product-Moment Correlation coefficients were computed between the global scores of the quality of life measurements and the screening questionnaires for postnatal depression.

Results: Both socio-economic status and quality of life have influenced significantly the depressive symptomatology and correlated epiphenomena. Significant correlations were observed among scores of postpartum depression screening tools and quality of life questionnaires. The socio-economic status of research participants was only significantly correlated to the scores generated by the WHOQOL-Brief questionnaire.

Conclusions: These findings confirm that socio-economic deficiencies and low quality of life can facilitate the expression of depressive symptomatology during the postpartum period. The results also emphasize the salience of psychosocial risk factors in the diathesis of postnatal depression.

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Introduction

Mood disturbances represent the most frequent form of maternal psychiatric morbidity in the postpartum period. Maternal sadness affects approximately 50–80% of women in the postpartum period, with about 20% of those women developing postpartum depression. In the first 3 months after childbirth, approximately 14.5% of women may have a new episode of major or minor depression, and 10–20% of mothers are believed to suffer with depression sometime during their postpartum course.

Literature review

Despite the widely documented adverse effects of postpartum depression on the maternal—infant interactions and the increasing number of studies about postpartum depression screening, little is known about the impact of this disorder on maternal functioning and well-being. Few studies have examined the impact of postpartum depression on the mother’s quality of life. Furthermore, there are only two specifically designed instruments available for the purpose of assessing maternal quality of life in the postpartum period. Most of all, it remains unclear whether the severity of depression is associated with the level of disability in the physical and mental domains.

The World Health Organization (WHO) defines Quality of Life (QoL) as individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. Quality of life is a broad ranging concept affected in a complex way by the person’s physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment (The WHOQOL Group, 1994). A limited number of studies have documented the impact of depressive symptoms on the quality of life of women experiencing the postpartum. The majority of these studies has examined QoL with generic instruments, i.e., not designed to cover specific health areas.

A Canadian study found that women with depressive symptomatology had lower Medical Outcomes Study Questionnaire (SF-36) scores and that these women had a significantly higher number of contacts with a health professional than those with non-depressive symptomatology. Recently, a Chilean study demonstrated a statistically significant correlation between the average score on the Edinburgh Postnatal Depression Scale (EPDS) and the somatic and emotional SF-36 scores, with depressed women presenting lower scores on the SF-36 items that measure vitality, and role limitations due to physical and emotional problems. Similar results were obtained by Da Costa et al., that demonstrated a significantly lower score on all SF-36 domains among women experiencing postpartum depression.

Additional studies have documented the impact of specific factors such as the newborn’s gender, primiparity and clinical status during gestation on the QoL of mothers. An Australian study demonstrated that 54 women reporting depressive symptoms had significantly lower SF-36 scores in 5 of the 8 dimensions of the instrument 24 weeks after delivery, including physical and emotional health, social functioning, mental health and vitality. This study also demonstrated that primiparous mothers experienced greater limitations due to physical difficulties. In a French study which 181 women were evaluated, postnatal depression significantly diminished SF-36 scores in all life dimensions. This study also showed that the baby’s gender — having a boy — significantly reduces quality of life, irrespective of depressive state. In an Italian study in which the World Health Organization Quality of Life-100 (WHOQOL-100) and the Beck Depression Inventory (BDI) were used to evaluate QoL and the presence of depressive symptomatology among 100 women revealed that women experiencing normal gestations had significantly higher QoL scores than women going through high-risk pregnancies.

In 2002, the first tool specifically designed for assessing QoL following childbirth was reported: The Mother-Generated Index (MGI). This instrument, initially validated in Scotland, is based on the Patient-Generated Index (PGI) and produces a primary global QoL index and a secondary index that quantifies the importance of subjective areas nominated by the mother. Another specific QoL instrument for the postpartum period is the Maternal Postpartum Quality of Life (MAPP-QOL), which is a self-administered quantitative instrument that measures QoL during the early postpartum period. The MAPP-QOL, which is structured in five domains, demonstrated convergent validity with measures of life satisfaction and mood states. A subsequent study using the MAPP-QOL to examine preterm, near-term, and term mothers’ quality of life in the early postpartum period revealed that the newborn’s gestational age at birth may influence maternal QoL during the postpartum period.

Postpartum depression is a significant public health problem worldwide. Its impact though is particularly salient in developing countries, where the prevalence of postpartum depression is three times higher than the figures of developed economies. Research evidence indicates that the rate of depressive symptoms are highly prevalent among Brazilian women of low income. In addition, a recent study demonstrated a higher incidence of postpartum depression (PPD) in Southern Brazil, where some factors such as non-white skin color skin color, absence of spouse or partner and a lower per capita income were significantly associated with PPD.

The present study, therefore, aims to assess the QoL of a sample of mothers in Southern Brazil, in order to investigate the association between postpartum depression and QoL standards. Taking into account the shortage of existing instruments designed for this purpose, the scales used in this study are not specific tools for the postpartum period. However, this limitation is outweighed by the fact that, to the authors’ knowledge, this is the first study in Brazil to evaluate QoL in women experiencing the postpartum with or without a depressive disorder.

Sample and methods

Subject recruitment

The study investigated a sample of 101 adult volunteers, who underwent deliveries in the General Hospital of the University of Caxias do Sul (UCS) in Southern Brazil, which is a higher education training facility and a regional reference center in...
Obstetrics. Research volunteers were recruited via word of mouth by members of the research team in the days following delivery while still in hospital. Inclusion criteria were as follows: (a) women needed to be available to be interviewed between the second and the twelfth week of the postpartum period; (b) women had to demonstrate cognitive capacity to understand and complete the questionnaire’s questions; (c) the mother must have delivered a live and healthy baby and (d) volunteers had to complete the informed consent to participate in this research protocol. Exclusion criteria made ineligible (a) women who did not have delivered in the General Hospital of Caxias do Sul and (b) women who were already under treatment from depression.

The sample size was calculated taking into account a population of 2000 women (number of parturients per year), an estimated minimum point prevalence (8%) as well as relevant statistical paradigms (power = 80%, C.I. = 5%, p = 0.05). Volunteers who fulfilled inclusion criteria were interviewed once only and at a convenient time, in their own abode, during the period encompassed between the second and the twelfth week of the postpartum period. Taking into account that a substantial fraction of the sample was illiterate or semi-illiterate, all women completed the questionnaires under minimal guidance by trained examiners, who followed standardized instructional procedures. Additional demographic information was also collected during the interview. All women who volunteered to participate in this investigation were assisted via the Brazilian public health system (SUS). All volunteers have Portuguese as their mother-tongue.

Informed consent

This study was endorsed by institutional Ethics and Research Committee. All volunteers signed a consent form to declare a voluntary agreement with all procedures implicated in this project. Participants were informed that they participation could be voluntarily terminated at any time without any consequence to the woman or to the quality of her health care. All information obtained from research volunteers were treated as confidential.

Assessment tools

World Health Organization Quality of Life Assessment-Bref (WHOQOL-Bref)
The WHOQOL-Bref was developed by the World Health Organization as an abbreviated 26-item version of the WHOQOL-100 instrument for measuring quality of life in a variety of cultural settings. The WHOQOL-Bref is structured as a 5-point Likert interval scale to reflect intensity, capacity, frequency and evaluation of each of its questions in four specific domains: physical, psychological, social relationships and environment. The WHOQOL-Bref was validated to a wide range of languages, including Portuguese.

Multicultural Quality of Life Index (MQLI)
The MQLI is a self-reporting questionnaire designed to measure Quality of Life according to 10 domains that include physical and emotional well-being, self-care, occupational and interpersonal functioning, community and services support, personal and spiritual fulfillment, as well as a global perception of Quality of Life. The subject rates each domain by circling a number on a 10-point line from 1 (poor) to 10 (excellent). The main index score is the average of 10 items rating (maximum average score = 10). The Portuguese version of the MQLI has been tested in a mixed sample of patients and health professionals in Brazil. Its briefness, easy application, internal consistency, and substantial reliability has been demonstrated.

The Postpartum Depression Screening Scale (PDSS)
The PDSS is a self-administered, 35-item 5-point Likert scale that usually requires between 5 and 10 min to be completed. It was developed to record the presence and degree of symptoms of postpartum depression experienced during the past 2 weeks, for which it should be used as a screening but not as diagnostic tool. The PDSS assesses the following seven dimensions: Sleeping/Eating Disturbances; Anxiety/Insecurity; Emotional Lability; Mental Confusion; Loss of Self; Guilt/Shame and Suicidal Thoughts. Total score for the PDSS ranges from 35 to 175.

The selection of PDSS questions was based on a series of studies developed by one of the authors of this psychometric tool.

Edinburgh Postnatal Depression Scale (EPDS)
The EPDS is a 10-item self-administered scale with four possible responses and a total score from 0 to 30. The Portuguese version of the EPDS was translated and validated for postpartum depression in a previous study. The validity of EPDS should be interpreted in light of the use for which it is intended. The best cutoff point for screening postpartum depression was ≥10, with 82.6% (75.3–89.9%) sensitivity and 65.4% (59.8–71.1%) specificity. For screening moderate and severe cases, the best cutoff point was ≥11, with 83.8% (73.4–91.3%) sensitivity and 74.7% (69.4–79.5%) specificity.

Socio-Economic Assessment

Research volunteers also completed a socio-economic status (SES) scale, which was developed and tested. This instrument classified volunteers according to four SES strata: Lower-Lower Class, Upper-Lower Class, Lower-Middle Class, Middle Class, Upper-Middle Class and Upper Class.

Statistical analysis

Analysis of demographic variables was performed in relation to gender, age, educational background and number of previous pregnancies and deliveries. In order to standardize different variables with different metrics and quantification systems, scores of different scales were converted to z scores and reverse-scaled so that all measures had positive values as their highest possible scores. Multiple regression analyses were conducted to predict the overall PDSS and EPDS scores. The analysis included SES class and QoL scores (according to both the MQLI and the WHOQOL-Bref) as predictors. The correlations among all assessment tools were examined using Pearson Product-Moment Correlation Coefficients. Statistical analysis was conducted via SPSS software.
Results

Demographic statistics

The mean age of the sample was 25.6 (SD = 7.04) with ages ranging from 14 to 42 years. Seventy-seven percent of the women were classified by interviewers as “White” as defined by Brazilian census. As for marital status, 39% of the mothers had de facto relationships, 37% were married, 22% were single and 2% were divorced. Considering different forms of delivery, 66% delivered vaginally, while 34% had cesarean delivery. Thirty-nine percent were having their first child; 32% and 30% were having their second and third deliveries or subsequent children, respectively. Fourteen percent of the women presented a previous history of miscarriage. Fifteen percent of women were smoking at the time of interview, while 2% of participants reported regular alcohol consumption. Twenty-two percent had developed some kind of disease during pregnancy, whereas 6% presented complications during delivery. Seventeen percent of mothers had a previous history of depression and 57% had a family history of depression.

At the time of interview, 69 participants (68.3%) were exclusively breastfeeding, 20 mothers (19.8%) were partially breastfeeding and 12 mothers (11.9%) were not breastfeeding. In term of socio-economic status (SES), the sample was distributed as follows: 1% (n = 1) in the Lower-Lower Class, 13.9 (n = 14) in the Upper-Lower Class, 71.3% (n = 72) in the Lower-Middle Class, 13.9% (n = 14) in the Middle Class. No participants were ranked in the Upper-Middle and Upper Classes. In terms of educational status, 2 participants had a university degree (2%); 6 participants had incomplete university education (5.9%); 21 participants (20.8%) had completed high school education; 26 mothers (25.7%) had an incomplete high school education; 6 mothers had complete primary school education; and 40 research participants (39.6%) had an incomplete primary school education.

Quality of Life Assessment

Both QoL instruments used in this study are “positive” scales (highly positive scores are favorable results) without “cut-off” limits to differentiate scores as “good” or “poor”. Of the 101 women enrolled in the study, 98 completed correctly all questions of the WHOQOL-Bref questionnaire, whereas all volunteers fulfill the MQLI questionnaire properly. Three volunteers failed to complete the WHOQOL-Bref properly: two research participants left one question incomplete and one participant failed to respond to two questions. The modes of all remaining scores of these three participants were used in the final analyses of data. The mean (SD) score of the WHOQOL-Bref in the above-mentioned sample was 86.86 (10.6), while the mean (SD) score according to the MQLI was 76.37 (16.2). Considering the EPDS scale, the mean (SD) was 8.35 (5.6), whereas the PDSS scale the mean (SD) was 76.37 (16.2). Considering the EPDS scale, the mean (SD) score was 86.86 (10.6), while the mean (SD) score according to the MQLI WHOQOL-Bref in the above-mentioned sample was 85.27 (26.3).

Correlation analyses

Pearson Product-Moment Correlation coefficients were computed among the overall scores of the QoL measurements (MQLI and WHOQOL-Bref), the screening questionnaires for postnatal depression (EPDS and PDSS) and the SES strata as demonstrated in Table 1. Using the Bonferroni approach to control for Type I error across the 8 correlations, a p value equal or less than 0.006 (0.05/8 = 0.00625) was required for significance.

Multiple regression analyses

Initially, a multiple regression analysis was conducted to predict changes in the overall PDSS score. The analysis included the SES class and MQLI score as predictors. The regression equation revealed that the predictors accounted for a significant proportion of the PDSS score variance, $R^2 = .63$, $F(2, 98) = 84.65$, $p < .001$. The correlation between each predictor and the overall PDSS score was as follows: MQLI = 0.77 and NSE = 0.28.

A second multiple regression analysis used the SES class and WHOQOL-Bref score as factors to predict changes in the overall PDSS score. The second regression equation revealed that the predictors also accounted for a significant proportion of the PDSS score variance, $R^2 = .56$, $F(2, 98) = 62.4$, $p < .001$, whereas the correlation between each predictor and the change PDSS score was WHOQOL-Bref = 0.75 and NSE = 0.28.

Another set of multiple regression analyses was conducted to predict changes in the overall EPDS score. An initial multiple regression analysis used the SES class and MQLI score as predictors to changes in the overall EPDS score. This regression equation revealed that the predictors also accounted for a significant proportion of the EPDS score variance, $R^2 = .56$, $F(2, 98) = 62.88$, $p < .001$. The correlation between each predictor and the change EPDS score was MQLI = 0.73 and NSE = 0.27.

Another regression analysis was conducted to predict changes in the overall EPDS score having the SES class and WHOQOL-Bref score as predictors. The regression equation revealed that the predictors accounted for a significant proportion of the PDSS score variance, $R^2 = .5$, $F(2, 98) = 49.55$, $p < .001$. The correlation between each predictor and the in the change EPDS score was as follows: WHOQOL-Bref = 0.71 and NSE = 0.27.

The linear regression analyses having the postpartum screening questionnaires (PDSS and EPDS) as dependent variables revealed that the predictors accounted for a significant proportion of the postnatal depression (EPDS and PDSS) and the SES strata as demonstrated in Table 1. Using the Bonferroni approach to control for Type I error across the 8 correlations, a p value equal or less than 0.006 (0.05/8 = 0.00625) was required for significance.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Correlation coefficients and respective significance levels between QoL questionnaires and the screening questionnaires for postnatal depression.</th>
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<tr>
<td></td>
<td>MQLI WHOQOL-BREF SES</td>
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<tr>
<td>PDSS</td>
<td>$r$ 0.78 &lt;sup&gt;a&lt;/sup&gt; 0.75 &lt;sup&gt;a&lt;/sup&gt; 0.28 &lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td></td>
<td>$p$ &lt;0.001 &lt;0.001 0.004</td>
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<tr>
<td>EPDS</td>
<td>$r$ 0.73 &lt;sup&gt;a&lt;/sup&gt; 0.71 &lt;sup&gt;a&lt;/sup&gt; 0.27 &lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td></td>
<td>$p$ &lt;0.001 &lt;0.001 0.006</td>
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EPDS: Edinburgh Postnatal Depression Scale; MQLI: Multicultural Quality of Life Index; PDSS: Postpartum Depression Screening Scale; SES: Socio-Economic Status; WHOQOL-Bref: World Health Organization Quality of Life Assessment-Bref.

<sup>a</sup> Correlation is significant according to Bonferroni corrected significance levels two-tailed.
criteria variables and the QoL questionnaires (MQLI and WHOQOL-Bref) as predictors are presented in Fig. 1.

Discussion

According to the obtained demographic information from the sample investigated in this study, the typical mother representing this sample was a white woman in her mid-20s, with poor educational background, positioned in the lower SES stratum, involved in a de facto relationship and nursing her first baby via breastfeeding after a vaginal delivery. The majority of mothers did not smoke nor consume alcoholic beverages at the time of their deliveries. Some had a previous history of depression, whereas most of them had a family history of depression.

Both SES and QoL have significantly influenced the depressive symptomatology and correlated epiphenomena as rated by both postpartum depression screening tools used in this study (PDSS and EPDS). The correlation between QoL scores and depressive symptoms was more substantial than the association between SES and the scores of postpartum depression screening tools as detected in both regression analysis conducted to predict changes in the PDSS or in the EPDS scores.

The associations among QoL, depressive symptoms in the postpartum period and, to a lesser extent, SES have also been detected via Pearson Product-Moment Correlation analyses. Significant correlations were observed among scores of both postpartum depression screening tools (PDSS and EPDS) and both QoL questionnaires (MQLI and WHOQOL-Bref). The SES of research participants was only significantly

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**Figure 1** Scatter plots depicting the linear regression between postpartum screening questionnaires (PDSS and EPDS) quality of life questionnaires (MQLI and WHOQOL-Bref).
correlated to the scores generated by the WHOQOL-Bref questionnaire.

Various studies have demonstrated the negative impact of depression on daily activities and productivity\(^\text{16,31}\) and their correlation with quality of life.\(^\text{38}\) Socio-economic factors such as lack of perceived support from the close contacts and family can operate as predictors for the experience of depressive symptoms during the postpartum period.\(^\text{39}\) A meta-analysis of 84 studies published in the previous decade revealed significant relationships between postpartum depression and various risk factors.\(^\text{40}\) Among the 13 significant predictors of postpartum depression detected, several had a socio-economic nature, including socio-economic status, social support, marital status and planning of pregnancy. Other predictors had a more evident link with the clinical diathesis of depression, such as history of a previous depressive episode, prenatal depression, prenatal anxiety, maternity blues, low self-esteem, presence of life stressors and childcare stress.\(^\text{40}\)

In fact, low self-esteem and a negative perception of overall of quality of life as assessed by the WHOQOL-Bref can be detected early during pregnancy in the case of women experiencing high-risk pregnancies.\(^\text{17}\) This association can evolve further in the postpartum period as revealed by the results of a Canadian study, in which a significant correlation between depressive symptoms as measured by the EPDS and lower scores in the mental health subscale of the Short-Form Survey Instrument (SF-36) was observed.\(^\text{41}\) As a possible consequence of these associations, women with depressive symptomatology tend to seek health care significantly more than mothers without depressive symptomatology.\(^\text{41}\)

A significant inverse association between SES and measures of health functioning have been reported in general population studies.\(^\text{42,43}\) Results from the Whitehall II population study revealed that, among women, there was an inverse correlation between employment grade and the physical and social functioning scales of the SF-36, which remained unchanged even after controlling for the social class of women’s partner.\(^\text{44}\)

The findings presented in the current study confirm the notion that socio-economic deficiencies and low QoL can facilitate the expression of depressive symptomatology during the postpartum period. The significant correlations between both QoL, SES and depressive symptomatology in the postpartum period as revealed in the current study raise a series of important implications at the preventive level. Health professionals who detect poor QoL during pre- or postpartum interview should closely examine the possibility of a postnatal depressive episode. Preventive programs aiming at early identification of potential risk factors for postnatal depression should include assessment of socio-demographic variables.

The regression analyses described above have not been controlled for history of previous depressive episodes or a family history of depression or any other mental illness. Although this may be considered as a limitation in this study, as revealed elsewhere, the predictive factors for a depressive episode can be of multiple kinds and potentially of interactive nature.\(^\text{40}\) Among the advantages of this study, is the fact that interviews were conducted at the participants’ abode in contrast with telephone interviews or mailed questionnaires as conducted in similar studies in the field. Research evidence indicates that the accuracy of self-reported health behaviours is subject to biases in the direction of underreporting negative findings.\(^\text{45,46}\) The personal interaction between investigator and research participant, as exercised in the study, has the potential to offer superior levels of reliability. In addition, the sample investigated in this study was recruited in a major public hospital in southern Brazil, which offers representative findings that may be generalizable to populations living under similar conditions in Brazil.

Conclusion

The results presented in this paper indicate that socio-economic deficiencies and low QoL can facilitate the expression of depressive symptomatology during the postpartum period. In terms of health care and clinical practice, the results emphasize the salience of psychosocial risk factors in the diathesis of postnatal depression. Future research should examine whether screening women with low QoL and significant SES disadvantages facilitates early diagnosis and treatment of postpartum depression in Brazil.

References